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May 21, 2010 RT10/09-338004

Ms. Kim Kido
1348 Alewa Drive
Honolulu, Hawaii 96817

Dear Ms. Kido:

Subject: Honolulu High-Capacity Transit Corridor Project
Comments Received on the Draft Environmental Impact Statement

The U.S. Department of Transportation Federal Transit Administration (FTA) and the City and County of Honolulu Department of Transportation Services (DTS) issued a Draft Environmental Impact Statement (EIS) for the Honolulu High-Capacity Transit Corridor Project. This letter is in response to substantive comments received on the Draft EIS during the comment period, which concluded on February 6, 2009. The Final EIS identifies the Airport Alternative as the Project and is the focus of this document. The selection of the Airport Alternative as the Preferred Alternative was made by the City to comply with the National Environmental Policy Act (NEPA) regulations that state that the Final EIS shall identify the Preferred Alternative (23 CFR § 771.125 (a)(1)). This selection was based on consideration of the benefits of each alternative studied in the Draft EIS, public and agency comments on the Draft EIS, and City Council action under Resolution 08-261 identifying the Airport Alternative as the Project to be the focus of the Final EIS. The selection is described in Chapter 2 of the Final EIS. The Final EIS also includes additional information and analyses, as well as minor revisions to the Project that were made to address comments received from agencies and the public on the Draft EIS. The following paragraphs address comments regarding the above-referenced submittal:

With a population of around 340,000, the Kaimuki-Waialae to Salt Lake-Aliamanu area described in your comment contains approximately 40 percent of the island's population of 876,200 people, and contains approximately 61 percent of the population of 552,100 within the transit corridor. The remaining transit corridor area (Salt Lake-Aliamanu to Kapolei) contains the other 39 percent of the population. While the remaining corridor contains a smaller population, shortening the route will fail to serve a large population with substantial transit demand.

As stated in Chapter 4, Section 4.2.3 of the Final EIS, the farmlands that will be acquired for the Project are in the Ewa Plain. The Ewa Development Plan designates areas for dense development while preserving other areas for agriculture. A maximum of 80 acres of prime farmland and 8 acres of statewide-important farmlands will be acquired by the Project, of which 70 acres are actively cultivated. All of the affected properties designated as prime, unique, or of statewide importance and/or actively farmed are owned by individuals, corporations, or agencies that plan to develop them in conformance with the Ewa Development Plan. The Project will be constructed on land designated for development as outlined in the Ewa Development Plan.

The 88 acres of prime, unique, and statewide-important land impact includes land that may be used for a maintenance and storage facility. One of the two alternatives for a maintenance and storage facility is in agricultural-related use (Aloun Farms). The preferred maintenance and storage facility site is located near Leeward Community College and is the site of a former Navy fuel storage and delivery facility. The Leeward Community College location is the preferred location for the maintenance and storage facility, and DTS has been working with the Navy to acquire it. If the City can acquire this site, only 47 acres of land designated as prime or of statewide importance will be acquired for the Project.

As stated in Section 4.2.3 of the Final EIS the 2002 Census of Agriculture (USDA 2004) reported that there are more than 70,000 acres of agricultural land in cultivation on O'ahu, including those designated as prime, unique, or of statewide importance. The displacement of agricultural lands as a result of the Project represents less than one-tenth of one percent of available agricultural land. Considering that the amount of affected farmland is such a small proportion of all agricultural lands on O'ahu, including those designated as prime, unique, or of statewide importance, the effect will not be substantial and no mitigation will be required.

As stated in Section 4.2.3 of the Final EIS, the proposed maintenance and storage facility site in Ewa is about half the amount of farmland required for the Project. If DTS can acquire the Leeward Community College site, only 47 acres of land designated as prime or of statewide importance will be used for the Project.

As stated in the Final EIS Section 4.2.3, some land uses will need to change in order to accommodate the Project; however, impacts to the natural and built environment are minimized whenever possible. Zoning changes are at the discretion of the City's Department of Planning and Permitting.

The Ewa Development Plan recognizes that agricultural land should be protected and designates areas for dense development while preserving other areas for agriculture. The displacement of agricultural lands as a result of the Project represents less than one-tenth of one percent of available agricultural land. The Project's effect will not be substantial and no mitigation will be required.

The 88 acres of prime and statewide important farmlands referenced in Table 4-1, Summary of Direct Environmental Effects and Mitigation Measures to Avoid, Minimize, or Reduce Impacts, in this Final EIS is limited to the transit project (guideway and associated facilities) and *do not include the development of the adjacent properties by other parties. These adjacent properties are designated for development in the Ewa Development Plan.*

As discussed in Section 4.19.2, within station areas, the Project, combined with supportive public policies and favorable real estate market conditions, could attract transit-supportive development (TSD) and transit oriented development (TOD). The Ewa Development Plan stresses development in concert with a transit system. Although the addition of transit does not directly cause development to occur, plans and policies will encourage new development to be located near transit stations to take advantage of the transportation infrastructure and increased accessibility if a new transit line is built.

As stated previously, the Ewa Development Plan recognizes that agricultural land should be protected and designates areas for dense development while preserving other areas for agriculture. The transit system will help focus development in designated areas.

Much of the farmland acreage that could be acquired for the Project is located at one of the two alternatives for a maintenance and storage facility. The preferred alternative is a former Navy fuel storage and delivery facility near Leeward Community College. If it is acquired, agricultural land used for the project will be about 47 acres. The Final EIS identifies the existing land use, and where information is available, planned future use of land that would be affected by the Project.

The agricultural land in question is planned to be developed, independently of the proposed Project. The land is not planned to remain in agricultural use and the impacts of loss of agricultural land have been or are being addressed in the entitlement process for the planned development. The Project has been designed in compliance with the Ewa Development Plan.

Regarding convenience of mass transit, among the Project goals and objectives (Table 1-4 of this Final EIS) is to "improve access to planned development to support City policy to develop a second urban center." The Final EIS shows estimated traffic volumes for year 2030. Traffic is expected to grow with or without the Project being constructed. However, as indicated in Section 3.4.1 of the Final EIS, vehicle miles traveled (VMT), vehicle hours traveled (VHT), and vehicle hours of delay (VHD) are projected to decrease under the Project as compared to the No Build Alternative. VMT is computed by multiplying the forecast number of trips using a roadway by the facility's total length in miles. VHT is derived by multiplying the number of trips using a roadway by the travel time for each travel period. VHD is calculated by finding the difference between the congested VHT and the VHT that would be expected under free-flow conditions. Table 3-14, Islandwide Daily Vehicle Miles Traveled, Vehicle Hours Traveled, and Vehicle Hours of Delay—Existing Conditions, No Build Alternative, and the Project, in the Final EIS shows an 18 percent reduction in VHD with the Project compared to the VHD for the No Build Alternative.

Regarding station access, as indicated in Table 3-20, Daily Mode of Access to Project Stations—2030, in this Final EIS, overall access to public transit will be enhanced with the Project. Based on the results of the travel demand forecasting model (described in Section 3.2 of the Final EIS) a substantial portion of project riders will access the system by local bus and by *walking and biking to the station. Bus, walk, and bike access to stations will account for approximately 90 percent of total trips in the a.m. peak period, 6 a.m. to 8 a.m.*

Several stations will be located near existing or planned bicycle facilities. As stated in Chapter 3, Section 3.4.5, the Oahu Bike Plan is currently being updated and is scheduled to be adopted in 2010. The draft update of the Oahu Bike Plan includes a prioritized list of bicycle projects developed using criteria that includes access to transit. Several projects that would connect existing or future bicycle facilities to rail transit stations are included in the draft update. Additionally, the City will provide parking facilities at four stations (East Kapolei, UH West Oahu, Pearl Highlands, and Aloha Stadium). These stations were selected based on results from the travel demand forecasting model which showed these stations had high drive-to-transit demand.

Regarding the use of mass transit, as presented in Chapter 3 of the Final EIS, the Project will result in reduced VMT, fewer hours of delay, and higher shares of total travel when compared to No Build conditions. As stated in Section 3.4.2 of the Final EIS, approximately 40,000 automobiles are forecast to be removed from roadways as a result of the Project, compared to the No Build Alternative. The specifics of this forecasting model can be found in 3.2.1.

As shown in Figure 3-10, 2030 Daily Boardings, Alightings, and Link Volumes, in the Final EIS, the stations on the Ewa end of the corridor will have high daily ridership. It is anticipated that the proposed fixed guideway system will allow development in the Ewa area to occur in an organized fashion around the well-defined transit system. Compact development patterns, better access, and, ultimately, use of the transit system are anticipated. In addition, bus service will be enhanced to provide connections between surrounding communities and fixed guideway stations. All stations will be accessible by bus, walking and bicycling. Future bus routes and frequencies are provided in Appendix D of the Final EIS.

Section 4.19.2 of the Final EIS addresses indirect effects of the Project on development patterns, while cumulative effects are presented in Section 4.19.3, where it is stated: "The bulk of future regional land use changes are expected in the study corridor." Indirect land development would be associated with TOD at the proposed stations, focusing rather than sprawling development. The analysis considers other planned development within the study corridor. Mitigation required to address impacts created by other proposed actions would be the responsibility of those developing the land.

The regional pollutant burdens estimated in Table 4-15, 2030 Mobile Source Regional Transportation Pollutant Burdens, of the Final EIS are based on VMT and VHT estimates throughout the study area. These estimates are based on regional planning models adopted by the OahuMPO. Emission rates are developed through the use of EPA's MOBILE6.2 Emission Factor program which takes into account vehicle mix, speed, meteorological conditions of the study area, and vehicular registration information. The Regional VMT model is reviewed by the State agencies for accuracy. Additional detail is available in the Transportation and Air Quality Technical Reports for the Project. The reports can be reviewed at the City and County of Honolulu Department of Transportation (DTS) Services office or on the Project website (www.honolulutransit.org).

The results shown in Table 4-15 of the Final EIS reflect mobile source emission burdens. As stated in the text, additional emissions will be generated due to the power requirements of the fixed guideway system. Table 4-21 indicates that the Project would require 2 percent less overall energy as compared to the No Build Alternative. The Project is expected to result in decreased emissions generated on the roadways and increased power source emissions resulting from fixed guideway energy consumption. However, the overall emission level for the Project is expected to be lower than the No Build Alternative because of anticipated reduced traffic congestion compared to the No Build Alternative (Section 3.4.2 of the Final EIS).

As summarized in Table 4-21, 2030 Summary of Average Daily Transportation Energy Demand, in the Final EIS, operation of the Project is anticipated to reduce daily transportation energy demand by approximately 3 percent compared to the No Build Alternative. This reduction is due to the reduction in VMT that occurs as a result of people switching from automobiles to the fixed guideway system and includes electrical energy required to operate the fixed guideway system.

VMT is the sum of the length of all highway segments multiplied by the number of vehicles that travel on them over the course of a day. The travel forecasting model performs that calculation each time the model is run. The differences in VMT between alternatives in the analyses are based on the differences in the numbers generated by the model. The same is generally true for VHT and VHD. VMT, VHT, and VHD forecasts have been developed using the travel demand model, which was calibrated and validated to current year conditions. The model is based upon a set of realistic input assumptions regarding land use and demographic changes, such as updates to population and employment patterns that reflect planned development on Oahu, between now and 2030 and expected transportation levels-of-service on both the highway and public transit system.

In response to your comment, the Final EIS (Section 4.9.3) was revised to remove the following sentence: "Any measures to reduce automobile travel would reduce air pollutant emissions."

Section 4.10 of the Final EIS addresses noise effects of the Project as related to applicable FTA noise criteria. As explained in Section 4.10.1 of the Final EIS, Ldn is an appropriate measure to assess community noise effects, because it considers both the total noise and the daily pattern of the noise experienced and reflects community reaction to environmental noise exposure. Maximum noise levels are not an appropriate measure of urban noise impact, as a single very loud event once a week would have less impact than a quieter event that occurs several times per hour. Leq is used to evaluate noise levels in areas where only the daytime use is noise sensitive. The analysis completed for the Project is consistent with FTA guidance. While Lmax does reflect the maximum noise from a single event, it does not describe either the frequency or duration of the noise event. Lmax is not used in transit noise assessment because it would not differentiate the impact of a single transit vehicle occurring once during the daytime from a constant flow of vehicles occurring over all daytime and nighttime hours.

The Final EIS includes additional information about how any severe noise impacts measured after project operation would be treated. As stated in Section 4.10.3 of the Final EIS, the Project will cause no severe noise impacts. Moderate impacts will occur at upper floors of a few high-rise buildings (as shown in Table 4-18 in the Final EIS). With the recommended mitigation in place (sound absorbing material and wheel skirts), the noise analysis indicates that the new noise generated by the Project will be lower than the existing (2009) noise levels in most locations.

The project design includes an integrated noise-blocking parapet wall at the edge of the guideway structure that extends three feet above the top of the rail. The parapet wall will substantially reduce ground-level noise.

In areas with high-rise apartments and hotels that have lanais above the elevation of and facing the rail, the parapet wall will have a limited benefit (less than a 3-dBA noise reduction) at floors above the level of the guideway. Wheel skirts will increase the benefit from the parapet wall at locations above the elevation of the track. The use of sound-absorptive materials below the tracks in the three areas that will experience moderate noise impacts will reduce the Project noise levels from the upper floors to below the impact level. Once the Project is operating, noise levels will be re-measured to confirm that there are no noise impacts from the Project. If additional noise impacts occur, then FTA will require the evaluation of measures to address the impacts.

The Project does not propose to convert waterbird habitat, including wetlands, into transportation facilities (Section 4.13.3). The Project will stay within existing roadway corridors along most of its route, except sites planned for the maintenance and storage facility and park-and ride lots. These proposed facilities are not located adjacent to any waterbird habitat, including wetlands. Consultation with U.S. Fish and Wildlife Service (USFWS) did not generate any concerns about project effects to habitat as referenced in Appendix F of the Final EIS.

Although this Project did not monitor the noise intensity and duration and other environmental impacts associated with construction of existing facilities near waterbird habitat, we anticipate that the Project will be similar and comparable to the construction effects of the existing facilities, although not equivalent in all aspects at all times. The project proposes to use drilled-shaft foundations to reduce or eliminate the need for pile driving.

Based on the information provided to FTA by USFWS, coordination with USFWS staff, and field observations, there will be "no effect" to threatened and endangered species or designated critical habitat related to this Project. Areas along the proposed corridor that are in close proximity to waterbird habitat have previously experienced major construction of roads, utility lines, bridges, elevated freeways, buildings, and other existing structures. As summarized in Section 4.13.3 of the Final EIS, there is not expected to be any effect to waterbirds as a result of the Project because it is anticipated that over time, the waterbirds will adjust to new structures. All wetlands will remain intact, and waterbirds continued to occupy the wetlands after the construction and widening of adjacent roads and highways.

Operational noise may generate some disturbance adjacent to the guideway when trains are passing; however, the noise will not be a critical factor in endangered waterbird survival since the quality waterbird habitat will remain intact. The noise levels generated by the Project will be similar to the existing highway-noise levels in the corridor.

The standard error, not the margin of error, of the following parameters was presented in the Honolulu High-Capacity Transit Corridor Project Ecosystems and Natural Resources Technical Report (2008j): the average number of individuals of each species per station and the average number of species per station or average richness for each corridor area. By providing the standard error of the averages and the sample size, we present what is conventionally required in the presentation of averages. From these statistics, one can derive confidence limits for the estimated population parameter, if desired. Further information about methodology is available in this technical report. The report can be reviewed at the City and County of Honolulu Department of Transportation (DTS) Services office or on the Project website (www.honolulutransit.org). The standard error ranged between 0.22 and 0.62 for bird count survey results.

The true values of the population parameters will almost always remain unknown and, therefore, it is common to estimate the reliability of the estimated parameter by setting confidence limits to it. There is no way to guarantee that the estimate, such as the average number of zebra doves at each point count station, is accurate. We can only express our degree of confidence in the average as a probability.

Field surveys were observations conducted while walking or driving around. We cannot place confidence limits on such observations since the manner in which the observations were conducted does not lend itself to statistical analyses. The presence and quantity of a species are influenced by many factors such as the time of day, season, and a host of environmental conditions, including the presence of disturbances, such as predators, aircraft, or construction noise, that can cause wildlife to temporarily move out of the area. However, these visits generally reveal what can be expected, based on previous anecdotal and scientific records of similar sites and habitats. They are, therefore, important in verifying and checking the species components and environmental characteristics that typify a site, but conclusions derived from these visits must be interpreted conservatively. Reported observations are accurate.

The design of the point counts was to determine what birds were present along the corridor and provide an index of abundance. Field surveys were designed to record the species observed.

As provided in the Honolulu High-Capacity Transit Corridor Project Ecosystems and Natural Resources Technical Report (RTD 2008j): "White terns may be directly affected by the project between Kalihi to University and Waikiki, because this species uses mature canopy trees as roosting and nesting sites almost exclusively. These trees could be affected by the construction of the fixed guideway system." This report can be found at the DTS office and on the Project website. VanderWerf (2003) indicates that while the white tern population on Oahu is still relatively small and restricted in range, it is increasing and robust. While white tern habitat is limited to large trees in southeastern Oahu, VanderWerf also indicates that if the population *grows they may move inland, to other coasts of the island and to other islands. While not as comprehensive, tern sightings during our observations along the corridor show a similar geographic distribution as VanderWerf found in 2001 to 2003. The tern population on Oahu still has area to expand. (Vanderwerf, E.A. 2003. Distribution, abundance, and breeding biology of white terns on Oahu, Hawaii. Wilson Bull., 115(3):258-262.) The only portion of tern habitat that will now be affected by the Project is between Kalihi and Ala Moana Center.*

The procedures for all field surveys were presented in Section 3.2. of the <u>Ecosystems and Natural Resources Technical Report</u> (RTD 2008j). Technical Reports can be found at DTS and on the Project website.

Scott, et al. (1986), used an 8-minute count period for their variable circular plot method to estimate bird densities in Hawaiian forests. They determined that the interval was long enough to allow an observer to accurately record all birds observed.The count period was selected as a compromise between efficiency and effectiveness. Point counts by Blondel, et al. (1981), were conducted for 20 minutes, but as the commenter points out, studies by Dettmers, et al. (1999) (not Bartlet et al.) indicate that 5- or 10-minute intervals are adequate.

Scott, J.M., S. Mountainspring, F.L. Ramsey, C.B. Cameron. 1986. "Forest bird communities of the Hawaiian Islands: their dynamics, ecology, and conservation." Studies in Avian Biology, No. 9.

Blondel, J., C. Ferry, and B. Frochot. 1981. "Point counts with unlimited distance." Studies in Avian Biology, No. 6:414-420. Cooper Ornithological Society.

Dettmers, R., D. A. Buehler, J. G. Bartlett, and N. A. Klaus. 1999. "Influence of point count length and repeated visits on habitat model performance." JWM 63(3):815-823.

Dettmers and Bueher (Dettmers, et al. 1999) stated that the one visit data did not perform as well in their model. "The current point count recommendations also suggest conducting only one visit/point, but we found that models developed from two visits/point consistently performed somewhat better than single visit models across all count durations and species. We concluded that conducting two visits/point will likely result in habitat models that perform better than models developed from a single visit. However, as with count duration, the potential benefits of increased model performance should be weighed against the additional costs in time and resources required to complete extra visits to each point."

During the alternative routes analyses, each route was surveyed once via the modified point count method using 8-minute count periods. After the route was selected, the preferred route was re-sampled using the same method resulting in two samples to determine the presence or absence of species and their relative abundance. Point counts were conducted from 7 a.m. to 11 a.m. All birds heard and seen were recorded, and no aural stimuli were used.

After evaluating the Ground Water Impact Assessment completed for the project, the Environmental Protection Agency (EPA) concurred that the Project should have no significant impacts on groundwater, either during long-term operation of the system or during its construction. These findings are presented in Section 4.13.3 of the Final EIS. The complete

Ground Water Impact Assessment and evaluation of other water resources is available to the public as part of the Honolulu High-Capacity Transit Corridor Project Water Resources Technical Report. This report can be found on the Project website and at the City and County of Honolulu, and the DTS office.

Permanent BMPs will include vegetated swales, retention ponds, and grit removal structures (Section 4.14.3 of the Final EIS). Where it is feasible, an increase in the amount of infiltration of clean water back into the water table aquifer is a design goal.

The Final EIS was revised to clarify the following air pollution statement: "Any measure to reduce automobile travel would reduce air pollutant emissions." Minimal pollutants are anticipated to be generated on the guideway. As shown in Table 4-15, of the Final EIS, the Project will reduce regional transportation pollutant emissions by between 3.9 to 4.6 percent compared to the No Build Alternative. If the electricity used to operate the Project is generated by combustion, this may produce additional emissions. However, these emissions will be offset in whole or part by the reductions generated by the reduction in transportation emissions, as indicated in Table 4-15. Furthermore, power plant emissions may be more easily controlled than emissions from individual automobiles. Further, as stated in Section 4.11.3, as a result of the decrease in VMT, total transportation energy demand for transit and highway vehicles will be 3 percent lower with the Project when compared to the No Build Alternative. This decrease in energy demand is due to the reduction in VMT that occurs as a result of people switching from automobiles to the fixed guideway system and includes electrical energy required to operate the fixed guideway system. This analysis accounts for both roadway vehicle propulsion energy and power requirements. Based on this, it is expected that the total emission burden generated by the Project will be lower than the No Build Alternative.

For the purposes of the environmental analysis presented in Section 4.14.2 of the Final EIS, the description of the functions of floodplains are limited to their hydrological functions. Section 4.14.2 also acknowledges the habitat functions of the floodplain. The environmental analysis of habitat functions of aquatic resources, including floodplains, is presented in Section 4.13 of the Final EIS.

The Mode Choice Model Calibration and Validation Report includes a more thorough discussion of the model calibration and validation process. This report can be obtained from DTS or on the Project website.

Transit ridership was forecast using a travel demand forecasting model. The model inputs are based on various inputs compiled from empirical information consistent with FTA guidelines. There is no indication that the energy needed by the fixed guideway will exceed the equivalent amount needed to move the same number of people in cars. In general, the fixed guideway will use less than 30 percent per capita of the amount of energy needed to power the number of cars required to carry the same number of people.

As stated previously, ridership projections for the forecast year of 2030 were developed using the travel demand model, which was calibrated against collected traffic and transit ridership information and then validated against current counts to be sure it properly represents *travel activity in the transportation system (Section 3.2.1 of the Final EIS). An on-board transit survey was completed in December 2005 and January 2006, and the latest socioeconomic information available as of October 2008 was incorporated. Traffic counts were collected in 2005, 2007, and 2008. The model is based upon a set of realistic input assumptions regarding land use and demographic changes between now and 2030 and expected transportation levels-of-service on both the highway and public transit system. Based upon the model and these key input assumptions, approximately 116,300 trips per day are expected to use the rapid transit system on an average weekday in 2030. Since the Draft EIS was published, the travel demand model has been refined by adding an updated air passenger model (which forecasts travel in the corridor related to passengers arriving or departing at Honolulu International Airport), defining more realistic drive access modes (driving alone or car pooling) to project stations and recognizing a more robust off-peak non-home-based direct demand element (trips that do not originate at home) based on travel surveys in Honolulu.*

The Project is one of the first in the country to design and undertake an uncertainty analysis of this type of travel forecast. The uncertainty analysis evaluates the variability of the forecast by establishing likely upper and lower limits of ridership projections. FTA has worked closely with the City during this work effort. A variety of factors were considered in the uncertainty analysis, including the following:

- *Variations in assumptions regarding the magnitude and distribution patterns of future growth in the Ewa end of the corridor.*
- *The impact of various levels of investment in highway infrastructure.*
- *The expected frequency of service provided by the rapid transit system.*
- *Park-and-ride behavior with the new system in place.*
- *The implications on ridership of vehicle and passenger amenities provided by the new guideway vehicles.*

Given all the factors considered, the anticipated limits for guideway ridership in 2030 are expected to be between 105,000 to 130,000 trips per day, bracketing the official forecast of 116,000 riders a day used for all calculations.

Chapter 3 of the Final EIS describes the results of the analysis, and Figures 3-9 and 3-10 show the number of passengers that will be carried by the fixed guideway during the a.m. peak period and daily. Compared to serving the same number of passengers with buses or in cars, there will be fewer vehicles on the road. As discussed in Section 2.5.6, bus service will be enhanced and the bus network will be modified to coordinate with the fixed guideway system. Some existing bus routes, including peak period express buses, will be altered or eliminated to reduce duplication of services provided by the fixed guideway system. Buses removed from service in the study corridor will be shifted to service in other parts of O'ahu, resulting in *improved transit service islandwide. Certain local routes will be rerouted or reclassified as feeder buses to provide frequent and reliable connections to the nearest fixed guideway station.*

According to the U.S. Department of Energy, Transportation Energy Data Book, for the year 2006, passenger cars require 3,512 BTUs per passenger mile while transit trains require 2,784 BTUs per passenger mile, and transit buses require 4,235 BTUs per passenger mile. Based upon these figures, transit trains are a more energy efficient mode of transportation compared to passenger cars or transit buses. These figures are influenced by the load factor (persons per vehicle). The Honolulu system currently has the fourth highest load factor of any transit system in the United States and the highest load factor for any transit system without a rail transit system (Table 3-8 in the Final EIS).

Vehicle efficiency is factored into energy calculations based on overall fleet performance. In general, performance is assumed to improve over time consistent with fleet requirements imposed by federal law or set by individual states.

The Project will rely on Hawaiian Electric Company (HECO)'s existing grid to provide propulsion for the trains and system operations for the trains. HECO is moving toward renewable energy generation. As that happens, the fixed guideway will also benefit from such new sources of energy. The 21 proposed stations and maintenance and storage facility will, to the extent possible, incorporate energy efficiency, alternative energy technologies, and other sustainable features into the design. This is being accomplished by including sustainability design criteria into the contract documents for the Project.

This list of methods provided in Section 4.12.3 of the Final EIS to limit the volume of hazardous materials used and the extent of worker exposure provides examples of how worker exposure will be limited. In addition, the Project will comply with applicable rules and regulations, such as Occupational Health and Safety Administration (OSHA) and Hawaii Occupational Safety and Health (HIOSH), and workers will be required to comply with material labels.

As stated previously, the preferred location for the maintenance and storage facility is located near Leeward Community College. If that location is used, the impacts to agricultural land will be significantly reduced.

The Alternatives Screening Memorandum (DTS 2006a) recognized the visually sensitive areas in Kakaako and Downtown Honolulu, including the Chinatown, Hawaii Capital, and Thomas Square/Academy of Arts Special Design Districts. To minimize impacts on historic resources, visual aesthetics, and surface traffic, the screening process considered 15 combinations of tunnel, at-grade, or elevated alignments between Iwilei and Ward Avenue. Five different alignments through Downtown Honolulu were advanced for further analysis in the Alternatives Analysis, including an at-grade portion along Hotel Street, a tunnel under King Street, and elevated guideways along Nimitz Highway and Queen Street.

The Alternatives Screening Memorandum (DTS 2006a) recognized the visually sensitive areas in Kakaako and Downtown Honolulu, including the Chinatown, Hawaii Capital, and Thomas Square/Honolulu Academy of Arts Special District. To minimize impacts on historic resources, *visual aesthetics, and surface traffic, the screening process considered 15 combinations of tunnel, at-grade, or elevated alignments between Iwilei and Ward Avenue. Five different alignments through Downtown Honolulu were advanced for further analysis in the Alternatives Analysis, including an at-grade portion along Hotel Street, a tunnel under King Street, and elevated guideways along Nimitz Highway and Queen Street (Figure 2-4).*

The Alternatives Analysis Report (DTS 2006b) evaluated the alignment alternatives based on transportation and overall benefits, environmental and social impacts, and cost considerations. The report found that an at-grade alignment along Hotel Street would require the acquisition of more parcels and could potentially affect more burial sites than any of the other alternatives considered. The alignment with at-grade operation Downtown and a tunnel under King Street, was not selected because of the environmental effects, such as impacts to cultural resources, reduction of street capacity, and property acquisition requirements of the at-grade and tunnel sections, which would cost an additional $300 million.

The Project's purpose is "to provide high-capacity rapid transit" in the congested east-west travel corridor (see Section 1.7 of the Final EIS). The need for the Project includes improving corridor transit mobility and reliability. The at-grade alignment would not meet the Project's Purpose and Need because it could not satisfy the mobility and reliability objectives of the Project (see bullets below). Some of the technical considerations associated with an at-grade versus elevated alignment through Downtown Honolulu include the following:

- ***System Capacity, Speed, and Reliability****—The short, 200-foot (or less) blocks in Downtown Honolulu would permanently limit the system to two-car trains to prevent stopped trains from blocking vehicular traffic on cross-streets. Under ideal operational circumstances, the capacity of an at-grade system could reach 4,000 passengers per hour per direction, assuming optimistic five minute headways. Based on travel forecasts, the Project should support approximately 8,000 passengers in the peak hour by 2030. Moreover, the Project can be readily expanded to carry over 25,000 in each direction by reducing the interval between trains (headway) to 90 seconds during the peak period. To reach a comparable system capacity, speed, and reliability, an at-grade alignment would require a fenced, segregated right-of-way that would eliminate all obstacles to the train's passage, such as vehicular, pedestrian, or bicycle crossings. Even with transit signal priority, the at-grade speeds would be slower and less reliable than an elevated guideway. An at-grade system would travel at slower speeds due to the shorter blocks, tight and short radius curves in places within the constrained and congested Downtown street network, the need to obey traffic regulations (e.g., traffic signals), and potential conflicts with other at-grade activity, including cars, bicyclists, and pedestrians. These effects mean longer travel times and far less reliability than a fully grade-separated system. None of these factors affects an elevated rail system. The elevated rail can travel at its own speed any time of the day regardless of weather, traffic, or the need to let cross traffic proceed at intersections.*

- ***Mixed-Traffic Conflicts***— *The Project will run at three minute headways. However, three-minute headways with an at-grade system would prevent effective coordination of traffic signals in the delicately balanced signal network in downtown Honolulu. A disruption of traffic signal cycle coordination every three minutes would severely affect traffic flow and capacity of cross-streets. Furthermore, there would be no option to increase the capacity of the at-grade rail system by reducing the headway to 90 seconds, which would only exacerbate the signalization problem. An at-grade system would require removal of two or more existing traffic lanes on affected streets. This effect is significant and would exacerbate congestion. Congestion would not be isolated to the streets that cross the at-grade alignment but, instead, would spread throughout Downtown. The Final EIS shows that the Project's impact on traffic will be isolated and minimal with the elevated rail, and, in fact will reduce system-wide traffic delay by 18 percent compared to the No Build Alternative (Table 3-14 in the Final EIS). The elevated guideway will require no removal of existing through travel lanes, while providing a reliable travel alternative. When traffic slows, or even stops due to congestion or incidents, the elevated rail transit will continue to operate without delay or interruption.*

  An at-grade light rail system with continuous tracks in-street would create major impediments to turning movements, many of which would have to be closed to eliminate a crash hazard. Even where turning movements are designed to be accommodated, at-grade systems experience potential collision problems. In addition, mixing at-grade fixed guideway vehicles with cars, bicyclists, and pedestrians presents a much higher potential for conflicts compared to grade-separated conditions. Where pedestrian and automobiles cross the tracks in the street network, particularly in areas of high activity (e.g., station areas or intersections), there is a risk of collisions involving trains that does not exist with an elevated system. There is evidence of crashes between trains and cars and trains and pedestrians on other at-grade systems throughout the country (e.g., Phoenix, Houston, LA). This potential would be high in the Chinatown and Downtown neighborhoods, where the number of pedestrians is high and the aging population presents a particular risk.

- ***Construction Impacts***—*Constructing an at-grade rail system could have more effects than an elevated system in a number of ways. The wider and continuous footprint of an at-grade rail system compared to an elevated rail system (which touches the ground only at discrete column foundations, power substations, and station accessways) increases the potential of utility conflicts and impacts to sensitive cultural resources. In addition, the extra roadway lanes utilized by an at-grade system would result in increased congestion or require that additional businesses or homes be taken to widen the roadway through Downtown. Additionally, the duration of short-term construction impacts to the community and environment with an at-grade system would be considerably greater than with an elevated system. Because of differing construction techniques, more lanes would* *need to be continuously closed for at-grade construction and the closures would last longer than with elevated construction. This would result in a greater disruption to business and residential access, prolonged exposure to construction noise, and traffic impacts.*

Because it is not feasible for an at-grade system through Downtown to move passengers rapidly and reliably without significant detrimental effects on other transportation system elements (e.g., the highway and pedestrian systems, safety, reliability, etc.), an at-grade system would have a negative system-wide impact that would reduce ridership throughout the system. The at-grade system would not meet the Project's Purpose and Need and, therefore, does not require further analysis.

As previously discussed, the Project must operate in a protected right-of-way to preserve system speed and reliability and neither automobiles nor pedestrians can be allowed to cross the tracks. For at-grade operation, this would require a fenced right-of-way with no crossings. Because the City does not intend to acquire the right-of-way through the existing farmlands and future development, and because constructing at-grade and fencing the right-of-way would preclude crossing the tracks, an at-grade system would impair the current use and future development of surrounding lands. Any future crossing of the tracks would have to include construction of a bridge over the tracks.

Areas that are cleared and grubbed will be re-vegetated to the extent possible. This is included in Section 4.18.10 of the Final EIS.

Trees will not be pruned until the young birds have fledged as stated in Section 4.18.8 of the Final EIS.

As presented in Section 4.12.3 of the Final EIS, "The City will decide whether a partial or complete Phase 1 [Environmental Site Assessment (ESA)] is necessary for each property prior to acquisition." The factors that will influence this decision-making process include:

- *Whether the parcel is a full or partial acquisition.*
- *Whether there is existing documentation regarding contamination investigation and/or documentation of remedial activities having occurred.*
- *The degree to which subsurface construction activities will be performed at that individual parcel.*
- *The type of contaminated media that is expected to be encountered.*

Also, archaeological studies will be completed as described in Section 4.16 of the Final EIS.

. Sites of concern are listed in Section 4.12 of the Final EIS in Table 4- 22. Some properties that will be acquired to obtain required right-of-way for the Project received a rank of "1" or "2" during the Initial Site Assessment (Table 4-22) and, therefore, may be polluted. Either a partial or complete Phase I Environmental Site Assessment (ESA) will be performed by the City prior to acquiring portions of these properties to lessen the chance that the City will acquire a degraded piece of real estate or that workers will be exposed to contaminants during construction. ESAs will also be performed for those sites listed in Table 4-23. ESAs will be conducted per the ASTM International's Standard Practice for Environmental Site Assessments—Phase I Environmental Site Assessments Process (E1527-05) (ASTM 2005). Site assessments have already begun, are ongoing, and will continue prior to construction of the Project. Depending on the outcome of the Phase I ESAs, a Phase II assessment (including collecting and analyzing samples) may be appropriate. The City will decide whether a partial or complete Phase I ESA is necessary for each property prior to acquisition. If contaminated materials are identified, the property will be remediated in accordance with Federal, State, and Local regulations. The City will coordinate with the HDOT Hazard Evaluation and Environmental Response Office regarding work within HDOT rights-of-way. Specific pre-construction activities regarding contaminated media are discussed in Section 4.18.7 of the Final EIS.

Contractors will be required to prepare a Solid Waste Management Plan to identify procedures to reduce solid waste. Measures to minimize construction waste will be included in the plan prepared by the contractor.

As discussed in Chapter 3, Section 3.2.1, ridership projections for the forecast year of 2030 have been developed using the travel demand model, which was calibrated and validated to current year conditions consistent with FTA guidelines. The model is based upon a set of realistic input assumptions regarding land use and demographic changes between now and 2030 and expected transportation levels-of-service on both the highway and public transit system.

The Project is one of the first in the country to design and undertake an uncertainty analysis of this type of travel forecast. The uncertainty analysis evaluates the variability of the forecast by establishing likely upper and lower limits of ridership projections. FTA has worked closely with the City during this work effort. A variety of factors were considered in the uncertainty analysis, including the following:

- *Variations in assumptions regarding the magnitude and distribution patterns of future growth in the Ewa end of the corridor.*
- *The impact of various levels of investment in highway infrastructure.*
- *The expected frequency of service provided by the rapid transit system.*
- *Park-and-ride behavior with the new system in place.*
- *The implications on ridership of vehicle and passenger amenities provided by the new guideway vehicles.*

The FTA-approved forecasting methodology is not a probabilistic analysis and does not inherently provide margins of error.

The Final EIS includes the best available information regarding all resources and effects of the Project.

The FTA and DTS appreciate your interest in the Project. The Final EIS, a copy of which is included in the enclosed DVD, has been issued in conjunction with the distribution of this letter. Issuance of the Record of Decision under NEPA and acceptance of the Final EIS by the Governor of the State of Hawaii are the next anticipated actions.

Very truly yours,

WAYNE Y. YOSHIOKA
Director

Enclosure